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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,093	09/17/2003	Seok-Jun Won	5649-906DV	6185
20792	7590	10/01/2004	EXAMINER	
MYERS BIGEL SIBLEY & SAJOVEC			WEISS, HOWARD	
PO BOX 37428			ART UNIT	PAPER NUMBER
RALEIGH, NC 27627			2814	

DATE MAILED: 10/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center"><b>Office Action Summary</b></p>	<p>Application No.</p> <p align="center">10/665,093</p>	<p>Applicant(s)</p> <p align="center">WON ET AL.</p>	
	<p>Examiner</p> <p align="center">Howard Weiss</p>	<p>Art Unit</p> <p align="center">2814</p>	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 September 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 ~~is~~ are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 ~~is~~ are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 10/028,187.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| <p>1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br/> Paper No(s)/Mail Date <u>0903</u>.</p> | <p>4) <input type="checkbox"/> Interview Summary (PTO-413)<br/> Paper No(s)/Mail Date. _____</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)</p> <p>6) <input type="checkbox"/> Other: _____</p> |
|--|---|

Attorney's Docket Number: 5649-906DV

Filing Date: 9/17/03

Continuing Data: Division of 10/028,187 (12/20/2001 now U.S. Patent No. 6,653,186)

Claimed Foreign Priority Date: 12/26/00 (KRX)

Applicant(s): Won et al. (Yoo)

Examiner: Howard Weiss

***Specification***

1. The disclosure is objected to because of the following informalities:
  - a. In Line 3 on Page 1 of the Specification, ---now U.S. Patent No. 6,653,186--- should be inserted after "2001."
  - b. In Lines 14 and 15 on Page 7 and Line 6 on Page 9, it is unclear what units "D" represents.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 9 is rejected under 35 U.S.C. 102(e) as being anticipated by Nakamura (U.S. Patent No. 6,573,553).

Nakamura shows all aspect of the instant invention (e.g. Figure 31B) including:

- an electrically insulating electrode support layer **22,23,24,47** having an opening and on an integrated circuit substrate **19**
  - a U-shaped lower electrode **54** with an inner and outer portion
  - a capacitor dielectric layer **55** extending on the outer portion and between the outer portion and an inner sidewall of the opening (within the dotted circle)
4. Claims 1, 2, 5 and 7 to 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamada (U.S. Patent No. 5,023,683).

Yamada shows all aspects of the instant invention (e.g. Figures 1) including:

- an electrically insulating, silicon oxide support layer **7a** having an opening and on an integrated circuit substrate **1**
- a U-shaped lower electrode **10a** with an inner surface and an outer portion
- a first capacitor dielectric layer **11a** extending on the outer portion, on the outer portion and on the support layer
- a second capacitor dielectric layer **9a** extending between the outer portion and the first capacitor dielectric and between the outer portion and an inner sidewall of the opening said second capacitor dielectric layer not extending on said inner surface and made of an oxide etch-resistant material (i.e. silicon nitride)
- an upper electrode **12** on the first capacitor dielectric layer

#### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the

various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 3, 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada and Nakamura.

Yamada shows most aspects of the instant invention (Paragraph 4) except for the support layer comprising an etch stop layer comprising silicon nitride and said first dielectric layer comprising tantalum oxide. Nakamura teaches (e.g. Figure 31B and Column 27 Line 1 to Column 28 Line 67) teaches to make a support layer with an etch stop layer **47** comprising silicon nitride and the first capacitor dielectric **55** comprising tantalum oxide to realize an higher integration and higher density semiconductor integrated circuit device (Column 30 Lines 8 to 11). It would have been obvious to a person of ordinary skill in the art at the time of invention to make a support layer with an etch stop layer comprising silicon nitride and the first capacitor dielectric comprising tantalum oxide as taught by Nakamura in the device of Yamada to realize an higher integration and higher density semiconductor integrated circuit device.

### ***Conclusion***

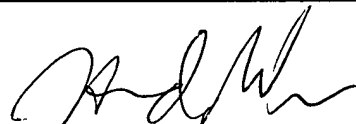
7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Arima et al. (IEDM 90) show a similar device as the instant invention.
8. Paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions as of June 2004. Paper copies

of foreign patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site ([www.uspto.gov](http://www.uspto.gov)), from the Office of Public Records and from commercial sources. Applicants are referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 for information on this policy. Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.

9. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 872-9306**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via [Howard.Weiss@uspto.gov](mailto:Howard.Weiss@uspto.gov).

11. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/ 304, 309	9/27/04
Other Documentation: PLUS Analysis Report	9/21/04
Electronic Database(s): EAST, IEL	9/27/04



Howard Weiss  
Patent Examiner  
Art Unit 2814

HW/hw  
28 September 2004